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). 47, pp. 545–550 24 January 1977

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TAXONOMIC IMPLICATIONS OF THE KARYOTYPES OF *MOLOSSOPS* AND *CYNOMOPS* (MAMMALIA: CHIROPTERA)

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Cabrera (1958:116) treated *Cynomops* Thomas, 1920, as a subgenus of *Molossops* Peters, 1865. Subsequently, most authors have either followed Cabrera (e.g., Goodwin and Greenhall, 1961; Jones and Dunnigan, 1965) or have not commented on subgeneric distinctions (Handley, 1966; Gardner et al., 1970); although, Husson (1962) used *Cynomops* at the generic level. Randolph L. Peterson, in a paper presented at the Third Annual North American Symposium on Bat Research (1972) and later (pers. comm.) also has favored generic status for both names. He would restrict *Molossops* to its type species, *M. temmincki* (Peters, 1865) and include all other currently recognized species under *Cynomops* (*Molossus cerastes* Thomas, 1901, type-species by original designation).

Heretofore, chromosomal studies on these bats (Linares and Kiblisky, 1969; Baker, 1970; Warner et al., 1974) contributed nothing toward elucidating the relationships between *Molossops* and *Cynomops*. Now, the karyotype of *Molossops temmincki* is available for comparison with those previously reported for *Molossops greenhalli* and *M. abrasus*. Also described herein is a chromosomal variant of *M. greenhalli* discovered during the course of investigations by this laboratory on the mammal fauna of the Mexican state of Nayarit.

Chromosomal material was prepared following the colchicine-hypotonic citrate sequence described by Patton (1967).

Definitions of fundamental number (FN) and terms describing chromosomal morphology were given by Patton (1967). The Colombian and Mexican specimens reported on here are deposited in the mammal collections of the National Museum of Natural History (USNM).

Description of Karyotypes

Molossops temmincki griseiventer Sanborn.—$2n = 42$, FN = 56 (Fig. 1a). Autosomes: 1 pair of large and 5 pairs of medium-sized metacentrics and submetacentrics; 2 pairs of small subtelocentrics; and 12 pairs of medium-sized to small acrocentrics. Sex chromosomes: X, a medium-sized subtelocentric; Y, a small acrocentric.

Material examined: Colombia; Intend. Meta, Villavicencio, Finca Buque (1 male, 1 female; USNM 507210–11).

Molossops greenhalli mexicanus Jones and Genoways.—$2n = 34$, FN = 60 (Fig. 1b). Autosomes: 2 pairs of large and 6 pairs of medium-sized metacentrics and submetacentrics; 3 pairs of large and 3 pairs of medium-sized subtelocentrics; and 2 pairs of small acrocentrics. Sex chromosomes: X, assumed to be a medium-sized subtelocentric; Y, not known since no males of this population have been analyzed. The Y of other populations is a small subtelocentric (Baker, 1970; Warner et al., 1974).

Material examined: México; Nayarit, Río Chilte, 480 ft., 1.2 mi S (by road) El Casco (1 female; USNM 511544).

Molossops greenhalli greenhalli (Goodwin).—$2n = 34$, FN = 60 (Fig. 1c). Autosomes: a graded series of 11 pairs of large to medium-sized metacentrics and submetacentrics; 3 pairs of medium-sized subtelocentrics; and 2 pairs of small acrocentrics. Sex chromosomes: X, a medium-sized subtelocentric; Y, a small submetacentric. This karyotype was described by Baker (1970), for a Trinidadan male, and Warner et al. (1974) for Costa Rican specimens. Linares and Kiblisky (1969), reporting on a Venezuelan male, described the sex chromosomes as a medium-sized metacentric X and a small metacentric Y.

Molossops abrasus (Temminck).—$2n = 34$, FN = 60. The karyotype of a Peruvian female is the same as that of *M. greenhalli* from Trinidad and Costa Rica (Warner et al., 1974).

Discussion

The karyotype of *Molossops temmincki* ($2n = 42$, FN = 56) differs markedly from that of *M. greenhalli* and *M. abrasus* ($2n = 34$, FN = 60). The differences support the recognition of *Molossops* and *Cynomops* at least at the subgeneric level. This range of karyotypic variation, while unusual in the chromosomally conservative Molossidae, is exceeded within the genus *Eumops* ($2n = 38$ to 48, FN = 56–64). *Eumops* and

FIG. 1. Representative karyotypes of *Molossops* and *Cynomops*. (a) *M.* (*Molossops*) *temmincki*; $2n = 42$, $FN = 56$; female; Villavicencio, Meta, Colombia; USNM 507210. (b) *M.* (*Cynomops*) *greenhalli mexicanus*; $2n = 34$, $FN = 60$; female; Río Chilte, Nayarit, México; USNM 511544. (c) *M.* (*Cynomops*) *greenhalli greenhalli*; $2n = 34$, $FN = 60$; female; Finca Lornessa, Santa Ana, San José, Costa Rica; Louisiana State University Museum of Zoology 13000.

Molossops (sensu lato) are also the only molossid genera known to have more than one diploid number (Warner et al., 1974). The karyotype of *Molossops temmincki* is closest to that of *Eumops auripendulus* (2n = 42, FN = 60) from which it differs in having a lower fundamental number (56), a subtelocentric X, and a small acrocentric Y. *Eumops auripendulus* has a metacentric X and a medium-sized subtelocentric Y. *Molossops temmincki* also has the same fundamental number as *E. underwoodi* and *E. perotis*. But, despite these and other chromosomal similarities, *Molossops* (sensu lato) and *Eumops* most certainly have independent evolutionary histories.

Although the karyotypic differences between *Molossops* and *Cynomops* are striking, we are left with the following question. Does recognition of *Molossops* and *Cynomops* at the generic level better reflect the true relationship between these taxa, or does it obscure their close phylogenetic affinity? Final resolution of this question clearly must await a detailed revision of the group.

The karyotype of *M. greenhalli mexicanus* differs from that of other populations of this species in the positions of the centromeres and the relative lengths of the autosomes (contrast b and c in Fig. 1). The two large metacentric and submetacentric pairs are equalled in size by two of the three pairs of large subtelocentrics. The latter are not present among the autosomes of other populations that have been analyzed. These differences are most likely the result of alterations of a karyotype, like that of Central and South American members of the species, through unequal translocations. Pericentric inversions and heterochromatin additions or deletions also may have contributed to the altered morphology of the autosomes.

The karyotype of the female from Nayarit is sufficiently distinct from that of the Costa Rican population to suggest the possibility of reproductive isolation (hybrid sterility) between their respective populations. Samples from these and intermediate populations should be compared to determine if additional evidence exists to support recognition of *mexicanus* at the species level.

Molossops greenhalli mexicanus, although previously unrecorded from Nayarit in the literature, was first discovered in that State by Terry Vaughan and Gary Bateman who collected two specimens at Los Limos and another at nearby La Peñita. These three, all females, are deposited in the mammal collections of the Northern Arizona University Museum of Vertebrates (NAU 1412, 1414, and 1264). The species is known elsewhere in México from the states of Jalisco, Guerrero, and Oaxaca (Jones and Dunnigan, 1965; Jones and Genoways, 1967) at localities all within the Pacific coastal region of western México.

Field work in Colombia was conducted under the auspices of INDERENA and I am deeply appreciative of the assistance rendered by personnel of the División de Parques Nacionales y Vida Silvestre, in particular Drs. Jorge Hernández C. and Simón M. Franky V. Investigations in México were kindly facilitated by Lic. Mario Luis Cossio G., director of the Dirección General de La Fauna Silvestre, under whose auspices collecting permits were acquired.

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